

**AMENDMENTS TO THE CLAIMS**

Please cancel pending claims 1 – 27 and add new claims 28-81.

Claims previously submitted:

1. (Canceled) A fossil fuel additive for reducing a pollutant emission, the additive comprising: a plant oil extract; an antioxidant; and a thermal stabilizer.
2. (Canceled) The fossil fuel additive of claim 1, wherein the plant oil extract comprises an oil extract of a plant of the Leguminosae family.
3. (Canceled) The fossil fuel additive of claim 1, wherein the plant oil extract is selected from the group consisting of oil extract of vetch and oil extract of barley.
4. (Canceled) The fossil fuel additive of claim 1, wherein the plant oil extract comprises chlorophyll.
5. (Canceled) The fossil fuel additive of claim 1, wherein the antioxidant comprises  $\beta$ -carotene.
6. (Canceled) The fossil fuel additive of claim 1, wherein the thermal stabilizer comprises jojoba oil.
7. (Canceled) The fossil fuel additive of claim 1, wherein the thermal stabilizer comprises an ester of a C20-C22 straight chain monounsaturated carboxylic acid.
8. (Canceled) The fossil fuel additive of claim 1, wherein the plant oil extract comprises oil extract of vetch, wherein the antioxidant comprises  $\beta$ -carotene, and wherein the thermal stabilizer comprises jojoba oil.

9. (Canceled) The fossil fuel additive of claim 1, further comprising a diluent.
10. (Canceled) The fossil fuel additive of claim 9, wherein the diluent is selected from the group consisting of toluene, fossil fuel additive, fossil fuel, fossil fuel, and mixtures thereof.
11. (Canceled) The fossil fuel additive of claim 1, further comprising an oxygenate.
12. (Canceled) The fossil fuel additive of claim 11, wherein the oxygenate is selected from the group consisting of methanol, ethanol, methyl tertiary butyl ether, ethyl tertiary butyl ether, and tertiary amyl methyl ether, and mixtures thereof.
13. (Canceled) The fossil fuel additive of claim 1, further comprising at least one additional additive selected from the group consisting of cetane improvers, detergents, corrosion inhibitors, metal deactivators, ignition accelerators, dispersants, anti-knock additives, anti-run-on additives, anti-pre-ignition additives, anti-misfire additives, antiwear additives, antioxidants, demulsifiers, carrier fluids, solvents, fuel economy additives, emission reduction additives, lubricity improvers, and mixtures thereof.
14. (Canceled) The fuel additive of claim 8, wherein a ratio of grams of plant oil extract of vetch to grams of  $\beta$ -carotene in the additive is from about 50:1 to about 1:0.05, wherein a ratio of grams of oil extract of vetch to milliliters jojoba oil in the additive is from about 12:1 to about 1:0.05, and wherein a ratio of milliliters jojoba oil to grams of  $\beta$ -carotene in the additive is from about 12:1 to about 1:0.5.
15. (Canceled) The fuel additive of claim 8, wherein a ratio of grams of plant oil extract of vetch to grams of  $\beta$ -carotene in the additive is from about 24:1 to about 1:0.1, wherein a ratio of grams of oil

extract of vetch to milliliters jojoba oil in the additive is from about 6:1 to about 1:0.1, and wherein a ratio of milliliters jojoba oil to grams of  $\beta$ -carotene in the additive is from about 6:1 to about 1:1.

16. (Canceled) A hydrocarbon fuel, the fuel comprising a base fuel and a fuel additive for use in reducing a pollutant emission produced during combustion of the hydrocarbon fuel, the fuel additive comprising: a plant oil extract; an antioxidant; and a thermal stabilizer.
17. (Canceled) The hydrocarbon fuel of claim 16, wherein the fuel comprises a liquid hydrocarbon fuel
18. (Canceled) The hydrocarbon fuel of claim 16, wherein the fuel comprises a solid hydrocarbon fuel
19. (Canceled) The liquid hydrocarbon fuel of claim 17, wherein the plant oil extract comprises oil extract of vetch, wherein the antioxidant comprises  $\beta$ -carotene, wherein the thermal stabilizer comprises jojoba oil, and wherein the fuel comprises from about 0.0005 g to about 0.05 g oil extract of vetch per 3785 ml liquid hydrocarbon fuel, from about 0.00025 g to about 0.05 g  $\beta$ -carotene per 3785 ml liquid hydrocarbon fuel, and from about 0.001 ml to about 0.05 ml jojoba oil per 3785 ml liquid hydrocarbon fuel.
20. (Canceled) The liquid hydrocarbon fuel of claim 17, wherein the plant oil extract comprises oil extract of vetch, wherein the antioxidant comprises  $\beta$ -carotene, wherein the thermal stabilizer comprises jojoba oil, and wherein the fuel comprises from about 0.0013 g to about 0.023 g oil extract of vetch per 3785 ml liquid hydrocarbon fuel, from about 0.00053 g to about 0.021 g  $\beta$ -carotene per 3785 ml liquid hydrocarbon fuel, and from about

0.0018 ml to about 0.022 ml jojoba oil per 3785 ml liquid hydrocarbon fuel.

21. (Canceled) The solid hydrocarbon fuel of claim 18, wherein the plant oil extract comprises oil extract of vetch, wherein the antioxidant comprises  $\beta$ -carotene, wherein the thermal stabilizer comprises jojoba oil, and wherein the fuel comprises from about 2 g to about 10 g oil extract of vetch per 1000 kg solid hydrocarbon fuel, from about 2 g to about 50 g  $\beta$ -carotene per 1000 kg solid hydrocarbon fuel, and from about 1 ml to about 10 ml jojoba oil per 1000 kg solid hydrocarbon fuel.
22. (Canceled) The solid hydrocarbon fuel of claim 18, wherein the plant oil extract comprises oil extract of vetch, wherein the antioxidant comprises  $\beta$ -carotene, wherein the thermal stabilizer comprises jojoba oil, and wherein the fuel comprises from about 3.42 g to about 4.26 g oil extract of vetch per 1000 kg solid hydrocarbon fuel, from about 4.25 g to about 14.75 g  $\beta$ -carotene per 1000 kg solid hydrocarbon fuel, and from about 1.9 ml to about 5.7 ml jojoba oil per 1000 kg solid hydrocarbon fuel.
23. (Canceled) A method for producing a liquid hydrocarbon fuel, the method comprising the steps of: preparing a first additive by combining  $\beta$ -carotene, jojoba oil, and a diluent, the first additive comprising about 4 ml jojoba oil and about 4 g  $\beta$ -carotene per 3785 ml of the first additive; preparing a second additive by combining an oil extract of vetch, jojoba oil, and a diluent, the second additive comprising about 4 ml jojoba oil and about 19.36 g oil extract of vetch per 3785 ml of the second additive; and adding the first additive and the second additive to a base fuel to produce a liquid hydrocarbon fuel, such that the liquid hydrocarbon fuel comprises from about 0.15 ml to about 20 ml of the first additive per 3785 ml of liquid hydrocarbon fuel and from

about 0.3 ml to about 3.6 ml of the second additive per 3785 ml of liquid hydrocarbon fuel.

24. (Canceled) A method for producing a liquid hydrocarbon fuel, the method comprising the steps of: preparing a first additive by combining  $\beta$ -carotene, jojoba oil, and a diluent, the first additive comprising about 32 ml jojoba oil and about 32 g  $\beta$ -carotene per 3785 ml of the first additive; preparing a second additive by combining an oil extract of vetch, jojoba oil, and a diluent, the second additive comprising about 32 ml jojoba oil and about 155 g oil extract of vetch per 3785 ml of the second additive; and adding the first additive and the second additive to a base fuel to produce a liquid hydrocarbon fuel, such that the liquid hydrocarbon fuel comprises from about 0.0625 ml to about 0.625 ml of the first additive per 3785 ml of liquid hydrocarbon fuel and from about 0.3 ml to about 0.45 ml of the second additive per 3785 ml of liquid hydrocarbon fuel.
25. (New) A fossil fuel additive comprising
- a plant oil extract derived from grain;
  - a carotenoid; and
  - a thermal stabilizer.
26. (New) The additive of claim 25, wherein the grain is selected from the group consisting of fescue, clover, wheat, barley, oats, rye, sorghum, flax, triticale, rice, corn, spelt, millet, amaranth, buckwheat, quinoa, kamut and teff.
27. (New) The additive of claim 25 wherein the carotenoid is selected from the group consisting of  $\beta$ -carotene,  $\alpha$ -carotene, lycopene, leutin, betatene and mixtures thereof.

28. (New) The additive of claim 25, wherein the thermal stabilizer is selected from the group consisting of vegetable oils, nut oils, animal oils and mixtures thereof
29. (New) The additive of claim 25 wherein the plant oil extract is derived from barley and the carotenoid is  $\beta$ -carotene.
30. (New) The additive of claim 25 wherein the thermal stabilizer is meadowfoam oil.
31. (New) The additive of claim 25 further comprising a diluent.
32. (New) The additive of claim 31 wherein the diluent is selected from the group consisting of toluene, benzene, o-xylene, m-xylene, p-xylene, cyclohexanes, hexane, octanes, nonanes, fossil fuel, fossil fuel, fossil fuel, 2 cycle oil, resid fuel and mixtures thereof.
33. (New) The additive of claim 25 further comprising at least one additive selected from the group selected from octane improvers, cetane improvers, detergents, corrosion inhibitors, metal deactivators, ignition accelerators, dispersants, anti-knock additives, anti-run-on additives, anti-pre-ignition additives, anti-misfire additives, anti-wear additives, antioxidants, demulsifiers, carrier fluids, solvents, fuel economy additives, emission reduction additives, lubricity improvers, oxygenates and mixtures thereof.
34. (New) A fossil fuel additive comprising:
  - a hydrophobic plant oil extract;
  - a carotenoid; and
  - a thermal stabilizer selected from the group consisting of peanut oil, cottonseed oil, rape seed oil, macadamia oil, avocado oil, palm oil, palm kernel oil, meadowfoam oil, castor oil and mixtures thereof.

35. (New) The additive of claim 34 wherein the plant oil extract is derived from a member of the Leguminosae family.
36. (New) The additive of claim 34 wherein the plant oil extract is derived from grain.
37. (New) The additive of claim 34 further comprising a diluent.
38. (New) The additive of claim 37 wherein the diluent is selected from the group consisting of toluene, benzene, o-xylene, m-xylene, p-xylene, cyclohexanes, hexane, octanes, nonanes, fossil fuel, fossil fuel, fossil fuel, 2 cycle oil, resid fuel and mixtures thereof.
39. (New) The additive of claim 34 further comprising at least one additive selected from the group selected from octane improvers, cetane improvers, detergents, corrosion inhibitors, metal deactivators, ignition accelerators, dispersants, anti-knock additives, anti-run-on additives, anti-pre-ignition additives, anti-misfire additives, anti-wear additives, antioxidants, demulsifiers, carrier fluids, solvents, fuel economy additives, emission reduction additives, lubricity improvers, oxygenates and mixtures thereof.
40. (New) The additive of claim 34, wherein the carotenoid is selected from the group consisting of  $\beta$ -carotene,  $\alpha$ -carotene, lycopene, leutin, betatene and mixtures thereof.
41. (New) The additive of claim 34 wherein the plant oil extract is barley oil extract, and the carotenoid is  $\beta$ -carotene.
42. (New) The additive of claim 34 further comprising meadowfoam oil.
43. (New) A fossil fuel additive comprising;

a plant oil extract selected from the group consisting of hops oil extract, fescue oil extract, barley oil extract, green clover oil extract, wheat oil extract and mixtures thereof;

a carotenoid; and

a thermal stabilizer.

44. (New) The additive of claim 43 wherein the carotenoid is selected from the group consisting of  $\beta$ -carotene,  $\alpha$ -carotene, lycopene, leutin, betatene and mixtures thereof.
45. (New) The additive of claim 43, wherein the thermal stabilizer is selected from the group consisting of vegetable oils, nut oils, animal oils and mixtures thereof
46. (New) The additive of claim 43 wherein the plant oil extract is derived from barley and the carotenoid is  $\beta$ -carotene.
47. (New) The additive of claim 43 wherein the thermal stabilizer is meadowfoam oil.
48. (New) The additive of claim 43 further comprising a diluent.
49. (New) The additive of claim 48 wherein the diluent is selected from the group consisting of toluene, benzene, o-xylene, m-xylene, p-xylene, cyclohexanes, hexane, octanes, nonanes, fossil fuel, fossil fuel, fossil fuel, 2 cycle oil, resid fuel and mixtures thereof.
50. (New) The additive of claim 43 further comprising at least one additive selected from the group selected from octane improvers, cetane improvers, detergents, corrosion inhibitors, metal deactivators, ignition accelerators, dispersants, anti-knock additives, anti-run-on additives, anti-pre-ignition additives, anti-misfire additives, anti-wear additives, antioxidants, demulsifiers,



carrier fluids, solvents, fuel economy additives, emission reduction additives, lubricity improvers, oxygenates and mixtures thereof.

51. (New) The additive of claim 43 wherein the plant oil extract is barley oil extract, and the carotenoid is  $\beta$ -carotene.
52. (New) A fossil fuel comprising a base fuel and at least one addition wherein the additive comprises:
  - a plant oil extract derived from grain;
  - a carotenoid; and
  - a thermal stabilizer.
53. (New) The fossil fuel of claim 52, wherein the grain is selected from the group consisting of fescue, clover, wheat, barley, oats, rye, sorghum, flax, triticale, rice, corn, spelt, millet, amaranth, buckwheat, quinoa, kamut and teff.
54. (New) The fossil fuel of claim 52 wherein the carotenoid is selected from the group consisting of  $\beta$ -carotene,  $\alpha$ -carotene, lycopene, leutin, betatene and mixtures thereof.
55. (New) The fossil fuel of claim 52, wherein the thermal stabilizer is selected from the group consisting of vegetable oils, nut oils, animal oils and mixtures thereof.
56. (New) The fossil fuel of claim 52 wherein the plant oil extract is derived from barley and the carotenoid is  $\beta$ -carotene.
57. (New) The fossil fuel of claim 52 wherein the thermal stabilizer is meadowfoam oil.
58. (New) The fossil fuel of claim 52 further comprising a diluent.

59. (New) The fossil fuel of claim 58 wherein the diluent is selected from the group consisting of toluene, benzene, o-xylene, m-xylene, p-xylene, cyclohexanes, hexane, octanes, nonanes, fossil fuel, fossil fuel, fossil fuel, 2 cycle oil and resid fuel and mixtures thereof.
60. (New) The fossil fuel of claim 52 further comprising at least one additive selected from the group selected from octane improvers, cetane improvers, detergents, corrosion inhibitors, metal deactivators, ignition accelerators, dispersants, anti-knock additives, anti-run-on additives, anti-pre-ignition additives, anti-misfire additives, anti-wear additives, antioxidants, demulsifiers, carrier fluids, solvents, fuel economy additives, emission reduction additives, lubricity improvers, oxygenates and mixtures thereof.
61. (New) The fossil fuel of claim 52 wherein the plant oil extract is barley oil extract, the carotenoid is  $\beta$ -carotene.
62. (New) A fossil fuel comprising a base fuel and at least one addition wherein the additive comprises:
- a hydrophobic plant oil extract;
  - a carotenoid; and
  - a thermal stabilizer selected from the group consisting of peanut oil, cottonseed oil, rape seed oil, macadamia oil, avocado oil, palm oil, palm kernel oil, meadowfoam oil, castor oil and mixtures thereof.
63. (New) The fossil fuel of claim 62 wherein the plant oil extract is derived from a member of the Leguminosae family.
64. (New) The fossil fuel of claim 62 wherein the plant oil extract is derived from grain.
65. (New) The fossil fuel of claim 62 further comprising a diluent.

66. (New) The fossil fuel of claim 65 wherein the diluent is selected from the group consisting of toluene, benzene, o-xylene, m-xylene, p-xylene, cyclohexanes, hexane, octanes, nonanes, fossil fuel, fossil fuel, fossil fuel, 2 cycle oil and resid fuel and mixtures thereof.
67. (New) The fossil fuel of claim 62 further comprising at least one additive selected from the group selected from octane improvers, cetane improvers, detergents, corrosion inhibitors, metal deactivators, ignition accelerators, dispersants, anti-knock additives, anti-run-on additives, anti-pre-ignition additives, anti-misfire additives, anti-wear additives, antioxidants, demulsifiers, carrier fluids, solvents, fuel economy additives, emission reduction additives, lubricity improvers, oxygenates and mixtures thereof.
68. (New) The fossil fuel of claim 62, wherein the carotenoid is selected from the group consisting of  $\beta$ -carotene,  $\alpha$ -carotene, lycopene, leutin, betatene and mixtures thereof.
69. (New) The fossil fuel of claim 62 wherein the plant oil extract is barley oil extract, the carotenoid is  $\beta$ -carotene.
70. (New) A fossil fuel comprising a base feed and at least one addition wherein the additive comprises:
- a plant oil extract selected from the group consisting of hops oil extract, fescue oil extract, barley oil extract, green clover oil extract, wheat oil extract and mixtures thereof;
- a carotenoid; and
- a thermal stabilizer.

71. (New) The fossil fuel of claim 70 wherein the carotenoid is selected from the group consisting of  $\beta$ -carotene,  $\alpha$ -carotene, lycopene, leutin, betatene and mixtures thereof.
72. (New) The fossil fuel of claim 70, wherein the thermal stabilizer is selected from the group consisting of vegetable oils, nut oils, animal oils and mixtures thereof
73. (New) The fossil fuel of claim 70 wherein the plant oil extract is derived from barley and the carotenoid is  $\beta$ -carotene.
74. (New) The fossil fuel of claim 70 wherein the thermal stabilizer is meadowfoam oil.
75. (New) The fossil fuel of claim 70 further comprising a diluent.
76. (New) The fossil fuel of claim 70 wherein the diluent is selected from the group consisting of toluene, benzene, o-xylene, m-xylene, p-xylene, cyclohexanes, hexane, octanes, nonanes, fossil fuel, fossil fuel, 2 cycle oil and resid fuel and mixtures thereof.
77. (New) The fossil fuel of claim 76 further comprising at least one additive selected from the group selected from octane improvers, cetane improvers, detergents, corrosion inhibitors, metal deactivators, ignition accelerators, dispersants, anti-knock additives, anti-run-on additives, anti-pre-ignition additives, anti-misfire additives, anti-wear additives, antioxidants, demulsifiers, carrier fluids, solvents, fuel economy additives, emission reduction additives, lubricity improvers, oxygenates and mixtures thereof.
78. (New) The fossil fuel of claim 70 wherein the plant oil extract is barley oil extract, the carotenoid is  $\beta$ -carotene.